

TROPICAL RAINFALL MEASURING MISSION

February 15, 1999 - February 21, 1999

DOY 046 - 052

Day of Mission 445 - 451

TRMM MISSION OPERATIONS

- TRMM is flying in the -X Forward direction as of 99-035, at 12:19:57z.
- The next Yaw maneuver is scheduled for March 4 (99-063).
- The next Delta-V maneuver is scheduled for February 22 (053) using the ISP thrusters.
- The Beta angle range for DOY 053 to 059 is -42.9° to -15.7° .

TRMM SUBSYSTEM OPERATIONS

Attitude Control System

Delta-V maneuver #79 was successfully conducted on 99-049 at 17:09:26z and 17:55:07z, for durations of 32 and 28 seconds respectively, using the ISP thrusters. The off-modulation of the -Pitch thruster (#6) was 35.9% and 36.2% respectively (64.1% and 63.8% on time). The remaining fuel is 757.75 kg and the final apogee and perigee height is 354.61 km x 347.41 km. This was the third maneuver with the $\pm 50^{\circ}$ Solar Array stops and the wider FDC threshold limit.

On 99-050, the TRMM daily EPV failed continuity in Y-axis position by 3 km (53 km difference between the propagating vector and the newly uplinked vector). A new vector was generated and delivered, but was still borderline to the threshold. As a result, ACS System Table #85 (Ephemeris Limits Table) was loaded to the spacecraft to widen the continuity limits for the TRMM Daily ephemeris (Anomaly #60). After the ephemeris was accepted by the spacecraft, the nominal Table #85 was copied from EEPROM to RAM. Trending is being performed to determine how often the daily vector is close to the threshold, and by what amount. This is the second time in the mission that the daily ephemeris failed the 50 km position threshold (see Event Reports 68 and 86).

The ESA experienced Sun interference in quadrants 1 and 3 during 99/046-047 and 050-052, overlapping Sun/Moon interference during 99/047-048, and Sun and Moon interference in quadrants 1 and 3 during 99/048-049. The ACS performed nominally during the transition between 3 and 4 head control. The predicted ESA quadrant interference duration report showed overlapping Sun/Moon interference times in excess of 13 minutes for 99/047. As a result, FDC tests 81-84 were disabled to prevent a potential Sun Acquisition mode transition. As an overview, Anomaly Report 67 was generated on 98-115 because these FDCs tripped once already. The result of that investigation showed that the original 10 minute threshold for a blocked ESA quadrant was too tight. A new limit of 13 minutes was uplinked, because FDF and ACS analysis showed blockage should never exceed that limit. New empirical analysis by FDF predicts that this limit is actually closer to 14.5 minutes, so a new table will be created and uplinked with wider limits.

New ACS TSM Monitors were loaded on 99-049. See Deployables section for more information.

Flight Data System (FDS)/Command & Data Handling (C&DH)

The Frequency Standard continues to drift in the negative direction and the frequency is still set to x74D. The UTCF is now 31535996.869660 sec after being adjusted -885 μ s on 99-049 at 23:54:16z. The current drift value is -269 μ s. The current drift rate is -3.83 μ s/hr.

Q-Channel Restarts occurred on 99-047 at 06:46:31z, 99-048 at 05:34:25z, 99-049 at 15:06:58 and 99-050 at 09:02:30z.

EDAC multi-bit errors occurred on 99-049 at 17:01:46z and 99-052 at 11:59:58z.

Invalid Stream ID from XS (VIRS) messages were received on 99-048 at 07:54:19z and 18:02:07z and on 99-051 at 22:13:39z.

Received an XI is not a Valid Sender message on 99-052 at 02:20:27z. Investigation continues to determine which instrument was the source.

Reaction Control Subsystem (RCS)

The RCS subsystem performed nominally during this period. See the ACS section for specific Delta-V information.

Power Subsystem

The Power subsystem operated nominally during this period.

Electrical Subsystem

The Electrical subsystem operated nominally during this period.

Thermal Subsystem

The Thermal subsystem operated nominally during this period.

Deployables Subsystem

The Deployables subsystem performed nominally during this period.

The new ACS telemetry statistical monitors (TSMs) #2-13 were uplinked (ACS System Table #21) on 99-049 and #2-7 were then activated. The TSMs generate event messages for solar array sensed position versus commanded position differences of 0.51°, 5°, and 10° which would indicate a potential GSACE failure. The threshold crossing messages are generated each slew in or out of eclipse or following any solar array stop, such as during daylight DeltaV maneuvers. These messages have been made green, and only Limit Fail messages will be red. Because of the

number of messages generated each day, the TSM Reset commands have been added to each daily load at 23:58:00z and 23:58:01z.

RF/Communications Subsystem

The RF/Communications subsystem has performed nominally during this period.

Telemetry hits were experienced on 99-052, resulting in CI and XA UNLOCK status for several seconds at 01:45:51z and 03:16:47z (Event Report #87). All realtime housekeeping data was recovered.

SPACECRAFT INSTRUMENTS

CERES

CERES is currently powered off and CERES personnel are developing a plan for operating the instrument with the +15 V DAA anomaly. The FOT proposal which describes the new method for leaving CERES powered on for SunAcq/Safehold events is awaiting final review and approval and testing.

Plans are being arranged to power CERES on again in March (likely 3rd-5th) for a limited duration.

LIS

LIS performed nominally during this time period.

PR

PR performed nominally during this time period. The list of Internal Calibration times for the week is listed below.

1999:046:13:42:43z - 13:45:56z
1999:046:21:46:09z - 21:48:16z
1999:047:20:34:45z - 20:36:56z
1999:048:12:52:29z - 12:57:34z
1999:049:19:45:45z - 19:47:55z
1999:050:12:04:04z - 12:08:10z
1999:050:18:34:33z - 18:36:47z
1999:052:17:45:24z - 17:47:37z

TMI

TMI performed nominally during this time period.

VIRS

VIRS performed nominally during this time period. As stated in FDS section, three Invalid Stream ID from XS messages were caused by VIRS during the week.

GROUND SYSTEM

String 2 upgrade is now complete, and testing will be conducted all next week for Mission Planning and other verifications prior to taking String 3 off-line. The GTAS machine has been upgraded to the new UNIX and GTAS software, and is now operating off the new 9GB hard drive. The Y2K compliant AMASS software has not been upgraded yet, so the jukebox cannot be accessed at this time.

No I-Channel data and intermittent Q-Channel data was received in the MOC for the first 9 min 5 sec of the 99-049 orbit 7051 event (Event #85). WSC performed a Forward Chain Failover, and all I-Channel data and commanding capabilities were restored at 99-049 at 02:38:35z. All data was recovered.

Event Reports

#85 - WSC Forward Chain Failover (See Ground System Section)

#86 - TRMM Daily EPV Continuity Failure (See ACS Section)

#87 - Telemetry Hits (See RF/Comm Section)

Generic Late Acquisition Reports (for TTRs 19639)

No Generic Late Acquisitions occurred during this week.

New Anomaly

No new Anomaly Reports were opened during this week.

Recurring Open Anomalies

No Open anomalies recurred during this week.

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